R22 Regulation *Subject code: 4P7DG*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VII Semester Supplementary Examinations, May 2026

REAL TIME OPERATING SYSTEMS

(ECE)

Maximum Marks: 60 Date:14.05.2026 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	Bloom Tx
1.a)	What command is used to display the contents of a file?	1M	1	L1
b)	What does the exec() family of functions do?	1M	1	L1
c)	List the various states of a task during its lifecycle.	1M	2	L1
d)	Outline the key operations used in message queuing mechanisms	1M	2	L2
e)	How does an operating system handle I/O?	1M	3	L2
f)	Name two key components of an I/O subsystem.	1M	3	L1
g)	How are spurious interrupts detected?	1M	4	L2
h)	Compare soft timers with hardware timers.	1M	4	L2
i)	Name one real-world application of VxWorks.	1M	5	L1
j)	What is TinyOS and what type of devices is it designed for?	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	Describe the various types of commands in UNIX/Linux with examples.	10 M	1	L3
	OR			
3	Explain the working of wait () and waitpid () system calls. Why are they important in process synchronization.	10 M	1	L3
4	With suitable examples, explain the role of objects and services in the functioning of a Real-Time Operating System."	10 M	2	L2
	OR			
5	Discuss the use of semaphores in synchronization. Define semaphore, explain its types and operations (wait, signal), and support your answer with an example".	10 M	2	L2
6	Explain the role of component configuration in embedded or real-time operating systems. Why is it important.	10 M	3	L2
	OR			

7	How do signals and event registers differ? In what scenarios is one preferred over the other?	10 M	3	L2
8	Discuss the role of real-time clocks (RTCs) in computing systems. How are they different from system timers?	10 M	4	L3
	OR			
9	Explain the structure and working of Timer Interrupt Service Routines (ISRs). Why is ISR design critical in real-time systems.	10 M	4	L2
10	Identify and explain the major challenges in porting applications from standard RTOSes like MicroC/OS-II or VxWorks to Embedded Linux.	10 M	5	L3
	OR			
11	Describe the design principles and programming model of TinyOS. Why is it well-suited for sensor networks and low-power embedded systems	10 M	5	L2